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abstract = {In the last decade, the detection and attribution science that links climate change to extreme weather and climate events has emerged as a growing field of research with an increasing body of literature. This paper overviews the methods for extreme event attribution (EEA) and discusses the new insights that EEA provides for infrastructure adaptation. We found that EEA can inform stakeholders about current climate risk, support vulnerability-based and hazard-based adaptations, assist in the development of cost-effective adaptation strategies, and enhance justice and equity in the allocation of adaptation resources. As engineering practice shifts from a retrospective approach to a proactive, forward-looking risk management strategy, EEA can be used together with climate projections to enhance the comprehensiveness of decision making, including planning and preparing for unprecedented extreme events. Additionally, attribution assessment can be more useful for adaptation planning when the exposure and vulnerability of communities to past events are analyzed, and future changes in the probability of extreme events are evaluated. Given large uncertainties inherent in event attribution and climate projections, future research should examine the sensitivity of engineering design to climate model uncertainties, and adapt engineering practice, including building codes, to uncertain future conditions. While this study focuses on adaptation planning, EEA can also be a useful tool for informing and enhancing decisions related to climate mitigation.

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